

## CLAIMS

What is claimed is:

1. A method for transferring call control to a backup call server, comprising:

5 monitoring a primary call server to determine an active or inactive state of said primary call server; and

upon receipt of an inactive state for said primary call server, forwarding signaling messages from a signaling gateway to a backup call server wherein each signaling gateway may have a different  
10 backup call server.

2. The method of claim 1 wherein the step of forwarding signaling messages further includes encapsulating the signaling message in a data packet with the destination address of the backup server.

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3. The method of claim 1 wherein the step of forwarding signaling messages further includes mapping a new destination address from the signaling gateway to the backup call server.

20 4. The method of claim 1 wherein a plurality of signaling gateways each distribute signaling messages destined for the primary call server to a plurality of backup call servers.

5. The method of claim 1 further including determining the primary call server has transitioned to the active state and subsequently thereto, forwarding signaling to the primary call server.

5 6. The method of claim 5 wherein the primary call server is provisioned to process all signaling messages it would have processed prior to transitioning to the inactive state.

7. The method of claim 5 wherein the primary call server is provisioned to process different signaling messages from what it would have processed prior to transitioning to the inactive state.

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8. The method of claim 1 wherein the primary call server and backup call server each comprise one of an MSC, a G-MSC, or an HLR.

9. The method of claim 1 wherein the primary call server also functions as a backup call  
15 server and further wherein the backup call server also functions as a primary call server.

10. A method for transferring call control to a backup call server, comprising:

transmitting call setup signals between a calling party mobile station and a BSC;

5 transmitting call setup signals between the BSC and an originating MSC;

transmitting call setup signals between the originating MSC and a gateway-MSC (G-MSC) by way of a first signaling gateway;

10 transmitting call setup signals from the G-MSC to an HLR, by way of a second signaling gateway, to determine a destination MSC;

transmitting destination MSC information from the HLR to the G-MSC by way of the second signaling gateway;

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upon determining that the destination MSC has failed, routing the call setup signals received from the G-MSC to a backup MSC and establishing a connection between the backup MSC and the originating MSC;

20 upon determining that the G-MSC has failed, routing the call setup signals received for the G-MSC to a backup G-MSC and establishing a connection between the backup G-MSC and the originating MSC; and

establishing a call connection between the calling party mobile station and a called party mobile station.

11. The method of claim 10 wherein the step of routing the call setup signals from the G-  
5 MSC to the backup MSC further comprises routing a first portion of the call setup signals from the G-MSC to a first backup MSC and a second portion of the call setup signals from the G-MSC to a second backup MSC.

12. The method of claim 10 wherein the step of routing the call setup signals from the G-  
10 MSC to the backup MSC further comprises routing a first portion of the call setup signals to a first backup G-MSC and a second portion of the call setup signals to a second backup G-MSC.

13. A cellular network, comprising:

a G-MSC for establishing call connections between originating MSCs and destination MSCs;

5 an HLR for providing location information to the G-MSC as a part of call setup;

at least one signaling gateway coupled between G-MSC and the HLR;

wherein the HLR determines a primary MSC to serve as a destination MSC for a call being setup

10 based upon a called party mobile station location;

wherein the HLR transmits call signaling messages to the at least one signaling gateway coupled between the HLR and the G-MSC; and

15 wherein the at least one signaling gateway redirects the call signaling messages to a backup G-MSC upon detecting that the G-MSC is in an inactive state.

14. A cellular network, comprising:

a G-MSC for establishing call connections between originating MSCs and destination MSCs;

5 a HLR for providing location information to the G-MSC as a part of call setup;

a first signaling gateway within a first plurality of signaling gateways coupled between each of a plurality of MSCs and the G-MSC;

10 a second signaling gateway coupled between the G-MSC and the HLR;

wherein the HLR reports a destination MSC for a call being setup based upon a called party mobile station location record maintained in the HLR;

15 wherein the HLR transmits call signaling messages to the second gateway coupled between the HLR and the G-MSC; and

wherein the second signaling gateway redirects the call signaling messages to a first backup G-MSC upon detecting that the G-MSC is in an inactive state; and

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wherein the first signaling gateway redirects the call signaling messages to a second backup G-MSC upon detecting that the G-MSC is in an inactive state.

15. The cellular network of claim 14 wherein the second gateway coupled between G-MSC and the HLR comprises one of a plurality of signaling gateways.

16. The cellular network of claim 14 further comprising at least one signaling gateway  
5 coupled between the G-MSC and an originating MSC.

17. The cellular network of claim 14 further comprising at least one signaling gateway coupled between the G-MSC and a destination MSC.

10 18. The cellular network of claim 17 wherein at least one of the first and second backup G-MSC also operates as a primary G-MSC.

19. A signaling gateway for a cellular network coupled to communicate with a destination switching element and to at least one home location register, comprising:

a processor;

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a memory for storing computer instructions that define the operational logic of the signaling gateway, wherein the computer instructions include logic for:

receiving call signaling messages from one of the HLR or an initiating MSC;

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determining whether the destination switching element is in an inactive state;

if the destination switching element is in an inactive state, determining a first backup switching element; and

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transparently forwarding the call signaling messages to the backup switching element.

20. The signaling gateway of claim 11 further including determining a second backup switching element and transparently forwarding a first group of call signaling messages to the first backup switching element and transparently forwarding a second group of call signaling messages to the second backup switching element.

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